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PENSOFT

New southernmost record of the European Brook Lamprey, *Lampetra planeri* (Bloch, 1784) (Agnatha, Petromyzontidae)

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Abstract
We report the occurrence of the European Brook Lamprey, *Lampetra planeri* (Bloch, 1784), in the Lao river in the Calabria region (southern Italy). This record extends the species' known distribution limit southwards. Information regarding some morphometric and ecological data are provided and discussed.

Key words
Distribution, Calabria, Italy, Lao.

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Introduction

Of the 38 recognized lamprey species (Docker 2006), 4 have been reported for Italy: the European Brook Lamprey *Lampetra planeri* (Bloch, 1784), the River Lamprey *Lampetra fluviatilis* (Linnaeus, 1758), the Sea Lamprey *Petromyzon marinus* (Linnaeus, 1758), and the endemic Lombardy Brook Lamprey *Lethenteron zanandreai* (Vladykov, 1955). *Lampetra planeri* is a small lamprey, with adults ranging in size from 150 mm to 200 mm. It is a non-parasitic species that spends its life in freshwater (Hubbs and Potter 1971, Malmqvist 1980, Maitland and Campbell 1992). Because of population declines in several parts of Europe (Kappus et al. 1995), *L. planeri* is now given some legal protection in the European Union. In fact, it is listed in Annexes IIa and Va of the Habitats Directive (92/43/EEC) as a species whose conservation requires the designation of Special Areas of Conservation (SACs). The species is also included in the Appendix III of the Bern Convention, and it is considered as Vulnerable in the Red Data Book for fish in Italy (Ciuffardi and Tancioni 2016). For these reasons new information regarding its distribution, ecology, and biology is crucial and deserves particular interest.

Lampetra planeri occurs in streams and occasionally in lakes in northwest Europe and in Portugal. Its presence in Spain has not been confirmed (Waterstraat and Krappe 1998, Freyhof 2011). In Italy, it was originally reported throughout all of the Italian Peninsula on the side of the Tyrrhenian Sea as far south as Campania. A population has been also observed in the Pescara River on the Adriatic side of the peninsula. In Lazio, it has been detected in several secondary watercourses of the Tiber and Garigliano basins, as well as in other minor courses (Tancioni 1996, Tancioni and Cataudella 2009, Sarrocco et al. 2012). In Campania, *L. planeri* is well represented in the basins of the Bussento and Calore, and recently, a small residual population has been detected

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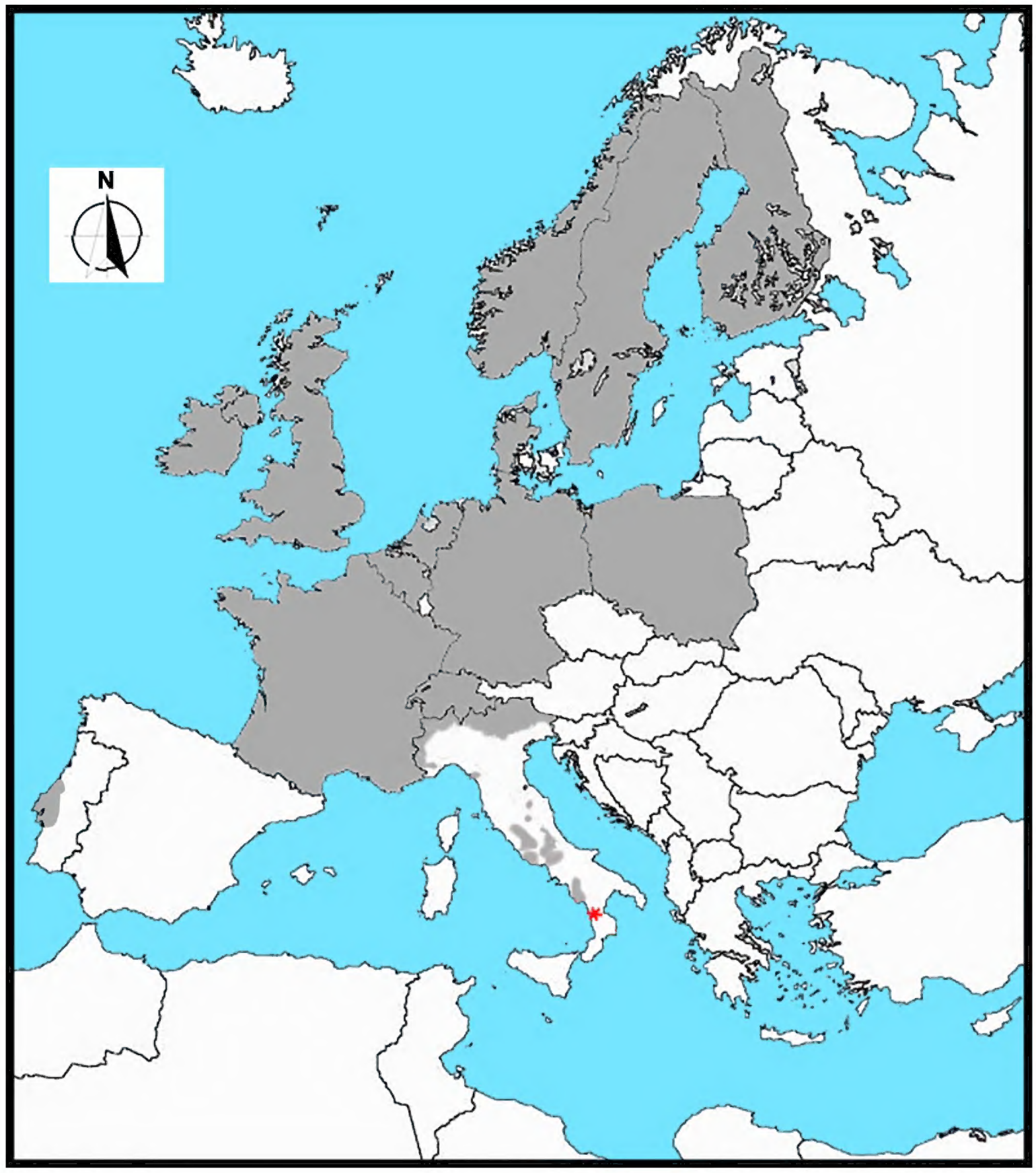

Figure 1. Distribution map of *Lampetra planeri*. Red star represents the new record for the Lao river.

in the Mingardo (Bianco et al. 2011). A gradual decline over the past 26 years in the Umbrian basin of the Tiber, where it once was abundant, has been reported, and *L. planeri* is now thought to be almost extirpated there (Lorenzoni et al. 2010).

We report, for the first time, the occurrence of *L. planeri* in the Lao river, in northwestern Calabria (southern Italy).

Methods

We examined 18 specimens (2 adults and 16 ammocoetes) of European Brook Lamprey collected during field activity along the Lao river. Specimens were collected by electrofishing (SCUBLA 1300 W backpack electrofisher). Specimens were identified according to Hardisty (1986) and Kottelat and Freyhof (2007). All measurements were recorded with a digital caliper following Kucheryaviy et al. (2017). We released all specimens at the place of their collection.

Results

New records. Italy: Calabria: right bank of the Lao (39°48′20″ N, 015°52′41″ E; 125 m elev.) (Fig. 1), 26 October 2018 (2 adults; 16 ammocoetes).

We observed a density of about 10 larvae m^{-2}. *Lampetra planeri* was found in the lateral pools of the river where current was slow and the substratum sandy. This species was in sympatry with *Anguilla anguilla* Linnaeus, 1758, *Sarmarutilus rubilio* (Bonaparte, 1837), *Squalius cephalus* Linnaeus, 1758, and *Salaria fluviatilis* (Asso, 1801). Among them, only *A. anguilla* has been reported to be a natural predator of the ammocoetes of *L. planeri* (Maitland and Lyle 2000).

Identification. Adults small, with 2 dorsal fins not touching each other and confluent with tail fin (Fig. 2a). Teeth blunt and little-developed. Supraoral plate wide, with no lower labial teeth, infraoral plate with 5–9 blunt teeth. Endolaterals have the formula 2-3-2 on each side and the infraoral lamina is 1b,3u,1b (where u = unicuspid and

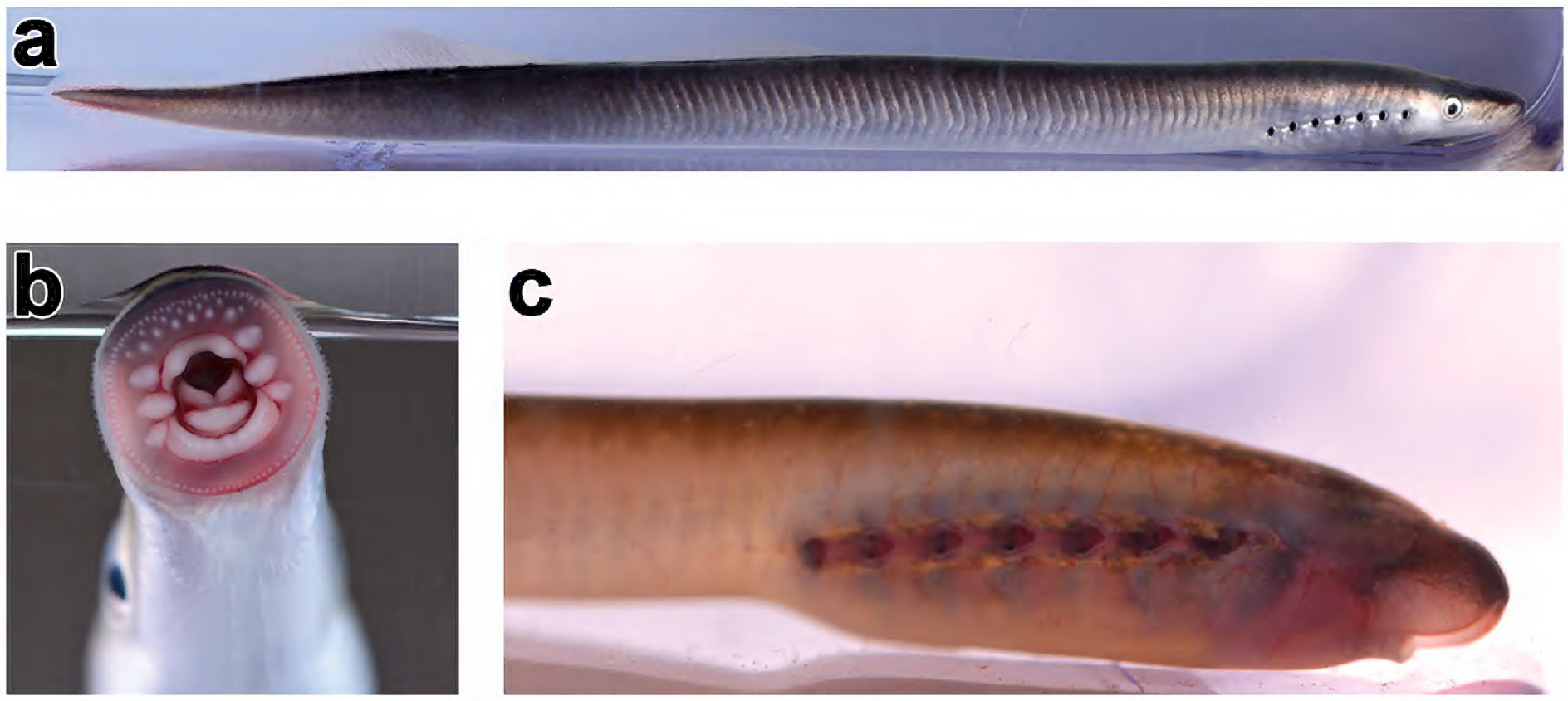

Figure 2. Specimens of *Lampetra planeri*. **a.** Adult (total length 170 mm). **b.** Oral disc of the adult (diameter 8.6 mm). **c.** Head and gill apparatus of the ammocoete (distance from the snout tip to the first gill opening 9.0 mm).

b = bicuspid) (Fig. 2b). Ammocoete larvae semitranslucent, mainly dull grayish-brown, and almost devoid of pigmentation (Fig. 2c). Morphometric data for the collected specimens are reported in Table 1.

Discussion

Our finding represents not only the first documented record for the Calabria region, but also the new southernmost known and confirmed population of *Lampetra planeri*. These data suggest that the population of the Lao is in a good state of conservation and the contemporary presence of the adult phase and the larval phase testifies to its vitality (Maitland and Lyle 2000). This record confirms the richness in aquatic species of the Lao river system and of the Pollino National Park in general (Talarico et al. 2004, Bonacci et al. 2008). Further studies expanding into other Calabrian rivers are necessary to evaluate the actual presence of the European Brook Lamprey in this region.

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Authors' Contributions

ES, SI, MF and GG collected the data. ES and ST examined the specimens. GG and FLL took the photographs and arranged table and figures. FLL and ST collected information and ES and SI wrote the text.

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Table 1. Morphometric data of *Lampetra planeri*. Mean, standard deviation and the range of morphometrics (in brackets) are given for each row. Also number of measured specimens is given (*N*). All measures are expressed in mm.

Morphometric data	Adults (*N* = 2)	Ammocoetes (*N* = 16)
Total length	172.5 ± 3.5 (170–175)	120.5 ± 18.2 (89–140)
Trunk length	76.85 ± 0.2 (76.7–77)	54.9±8.3 (40.5–63.8)
Length of caudal region	62.95 ± 0.6 (62.5–63.4)	42.3 ± 6.4 (31.2–49.2)
Snout length	7.45 ± 0.2 (7.3–7.6)	
Distance from snout tip to first gill opening	13.7 ± 0.4 (13.4–14)	7.7 ± 1.2 (5.7–9)
Length of branchial apparatus	16.55 ± 0.3 (16.3–16.8)	13.9 ± 2.1 (10.3–16.2)
Body depth between third and fourth gill openings	11.3 ± 0.9 (10.6–12)	6.4 ± 0.9 (4.7–7.5)
Distance from posterior eye edge to first gill opening	4.35 ± 0.3 (4.1–4.6)	
Horizontal eye diameter	2.3 ± 0.1 (2.2–2.4)	
Base length of second dorsal fin	43.3 ± 0.3 (43.1–43.5)	29 ± 4.3 (21.4–33.7)
Depth of first dorsal fin	2.7 ± 0.1 (2.6–2.8)	0.5 ± 0.06 (0.4–0.6)
Depth of second dorsal fin	5.4 ± 0.3 (5.2–5.6)	1.8 ± 0.3 (1.4–2.2)
Oral disk diameter	8.75 ± 0.2 (8.6–8.9)	Absent

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